

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 10-095698

(43)Date of publication of application : 14.04.1998

(51)Int.Cl.

C30B 29/06

C30B 15/20

C30B 33/02

(21)Application number : 09-214725

(71)Applicant : MEMC ELECTRON MATERIALS INC

(22)Date of filing : 08.08.1997

(72)Inventor : HAROLD W KOOBU  
SADASHIBAMU  
CHANDORASEKUHAA  
ROBERT J FALSTAR  
JOSEPH C HOLZER  
KYON-MIN KIM  
STEVEN L KIMBEL  
LARRY E DRAFORLE  
SURDAN ILIC

(30)Priority

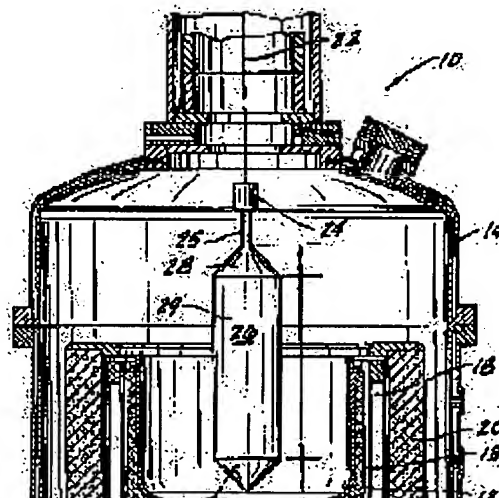
Priority number : 96 694157    Priority date : 08.08.1996    Priority country : US

(54) CONTROL OF HEAT HISTORY OF CZOCHRALSKI GROWTH TYPE SILICON

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a Czochralski growth process which can produce single crystalline silicon ingots having uniform heat history from the silicon melt contained in a crucible having the same axis as that of the ingot.

SOLUTION: The pulling up speed of the cone end part 30 of the ingot 26 is kept relatively constant comparable to the pulling up speed of the second half of the main body of the ingot. While the end cone 30 of the crystal is pulled up at a constant speed, the amount of heat to be fed to the melt may be increased, the



rotation of the crystal is reduced and/or the rotation of the crucible may be reduced whereby the process may be operated more precisely. The second half of the main body of the grown single crystal silicon ingot 26 is relatively uniform in the flow pattern defect and the concentration of the precipitating oxygen in the axial direction.

---

## LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]